

# MEF

## Introducing the Specifications of the MEF

**MEF 40: UNI and EVC Definition of Managed Objects**

**April 2013**

# MEF Reference Presentations

- **Intention**

- These MEF reference presentations are intended to give general overviews of the MEF work and have been approved by the MEF Marketing Committee
- Further details on the topic are to be found in related specifications, technical overviews, white papers in the MEF public site Information Center:

<http://metroethernetforum.org/InformationCenter>

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# Outline

- **Approved MEF Specifications**
- **About this Specification**
- **In Scope / Out of Scope**
- **Terminology, Concepts & Relationship to other standards**
- **MEF Service Lifecycle & Management Framework**
- **UNI-EVC MIB Review**
  - Section Descriptions
- **Summary**
- **Related Specifications**

# Approved MEF Specifications\*

Specification	Description
MEF 2	Requirements and Framework for Ethernet Service Protection
MEF 3	Circuit Emulation Service Definitions, Framework and Requirements in Metro Ethernet Networks
MEF 4	Metro Ethernet Network Architecture Framework Part 1: Generic Framework
MEF 6.1	Metro Ethernet Services Definitions Phase 2
MEF 7.2	Carrier Ethernet Management Information Model
MEF 8	Implementation Agreement for the Emulation of PDH Circuits over Metro Ethernet Networks
MEF 9	Abstract Test Suite for Ethernet Services at the UNI
MEF 10.2	Ethernet Services Attributes Phase 2
MEF 11	User Network Interface (UNI) Requirements and Framework
MEF 12.1	Metro Ethernet Network Architecture Framework Part 2: Ethernet Services Layer
MEF 13	User Network Interface (UNI) Type 1 Implementation Agreement
MEF 14	Abstract Test Suite for Traffic Management Phase 1
MEF 15	Requirements for Management of Metro Ethernet Phase 1 Network Elements
MEF 16	Ethernet Local Management Interface

\*Current at time of publication. See MEF web site for official current list, minor updates and superseded work (such as MEF 1 and MEF 5)

# Approved MEF Specifications

Specification	Description
MEF 17	Service OAM Framework and Requirements
MEF 18	Abstract Test Suite for Circuit Emulation Services
MEF 19	Abstract Test Suite for UNI Type 1
MEF 20	User Network Interface (UNI) Type 2 Implementation Agreement
MEF 21	Abstract Test Suite for UNI Type 2 Part 1: Link OAM
MEF 22.1	Mobile Backhaul Implementation Agreement Phase 2
MEF 23.1	Class of Service Implementation Agreement Phase 2
MEF 24	Abstract Test Suite for UNI Type 2 Part 2: E-LMI
MEF 25	Abstract Test Suite for UNI Type 2 Part 3: Service OAM
MEF 26.1	External Network Network Interface (ENNI) – Phase 2
MEF 27	Abstract Test Suite For UNI Type 2 Part 5: Enhanced UNI Attributes & Part 6: L2CP Handling
MEF 28	External Network Network Interface (ENNI) Support for UNI Tunnel Access and Virtual UNI
MEF 29	Ethernet Services Constructs

# Approved MEF Specifications

Specification	Description
MEF 30.1	Service OAM Fault Management Implementation Agreement: Phase 2
MEF 31	Service OAM Fault Management Definition of Managed Objects
MEF 32	Requirements for Service Protection Across External Interfaces
MEF 33	Ethernet Access Services Definition
MEF 34	Abstract Test Suite for Ethernet Access Services
MEF 35	Service OAM Performance Monitoring Implementation Agreement
MEF 36	Service OAM SNMP MIB for Performance Monitoring
MEF 37	Abstract Test Suite for ENNI
MEF 38	Service OAM Fault Management YANG Modules Technical Specification
MEF 39	Service OAM Performance Monitoring YANG Modules Technical Specifications
MEF 40	UNI and EVC Definition of Managed Objects

\*Current at time of publication. See MEF web site for official current list, minor updates (such as MEF 31.0.1 amendment to this document) and superseded work (such as MEF 1 and MEF 5)

# MEF Specification Overview

## MEF 40 – UNI and EVC Definition of Managed Objects

### Purpose

Specifies the SNMP UNI and EVC Management Information Base (MIB) that supports the MEF UNI and EVC defined in MEF 4, MEF 6.1, MEF 6.1.1, MEF 10.2, the management requirements in MEF 15, and the managed objects specified in MEF 7.2 and ITU-T Q.840.1. The MIB includes objects necessary to configure and monitor UNIs and EVCs via SNMP.

### Audience

Applicable to entire Metro Ethernet Market including Service Providers, Access Providers, equipment vendors, and EMS/NMS/OSS vendors to provision and monitor equipment that is MEF compatible.

# Overview of MEF 40



# About MEF 40

- **Purpose:**

- This presentation is an introduction to MEF 40 – UNI and EVC Definition of Managed Objects

- **Audience**

- Equipment Manufacturers building devices that will carry Carrier Ethernet Services
- Service Providers delivering Carrier Ethernet Services
- EMS/NMS/OSS tool vendors developing back office applications for managing, provisioning and monitoring Carrier Ethernet Services

- **Other Documents**

- Presentations of other MEF specifications and an overview of all specifications is available on the MEF web site
- Other materials such as white papers and case studies are also available

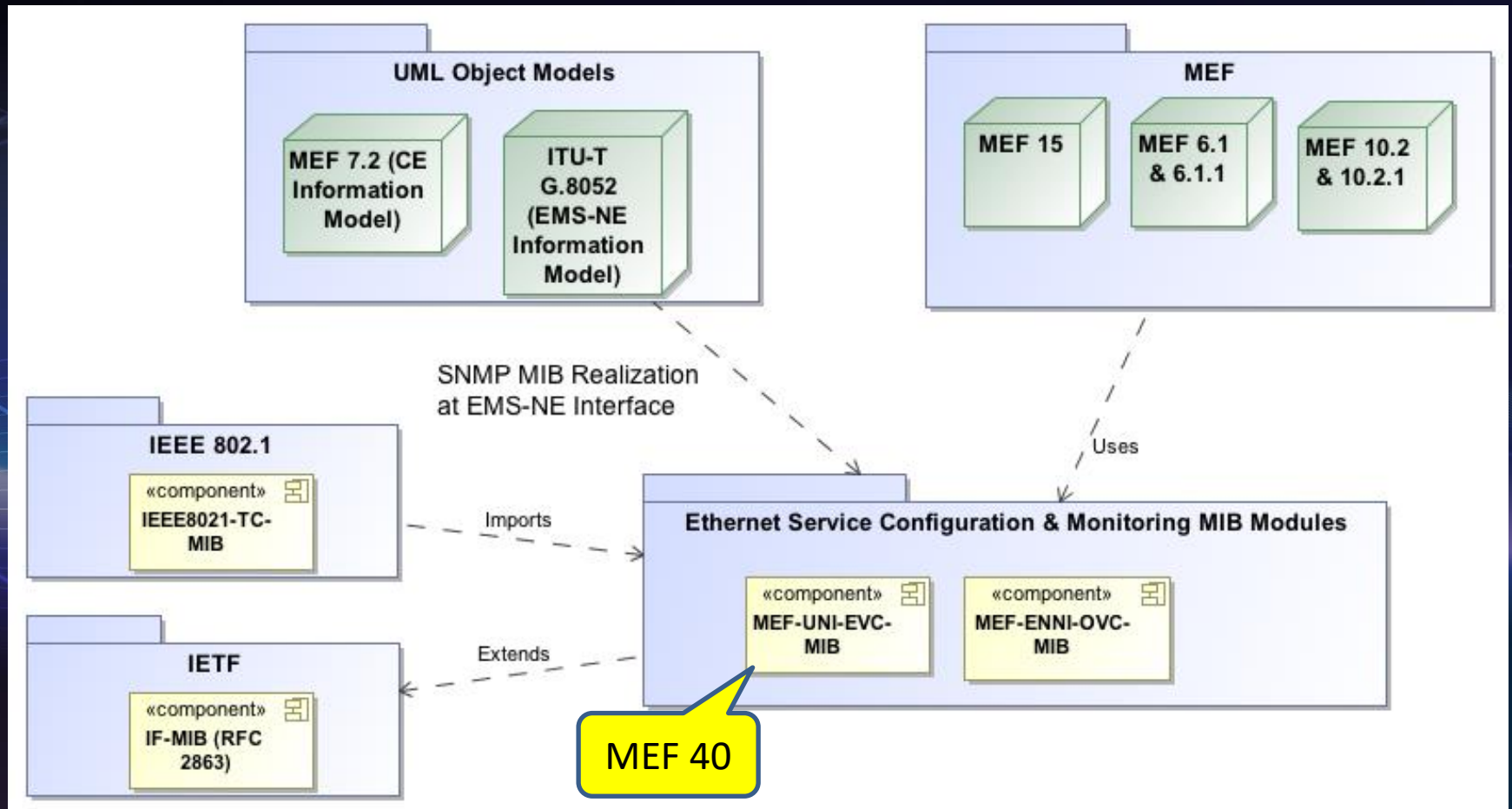
# MEF 40 - In Scope/Out of Scope

- **MEF 40 requirements are primarily driven by**
  - Network Management requirements for ME NEs (MEF 15)
  - Carrier Ethernet Common Information Model (MEF 7.2 and ITU-T Q.840.1)
- **MEF 40 defines functionality for managing UNI and EVC**
- **MEF 40 does not define functionality for managing ENNI or OVC**

# Terminology and Concepts

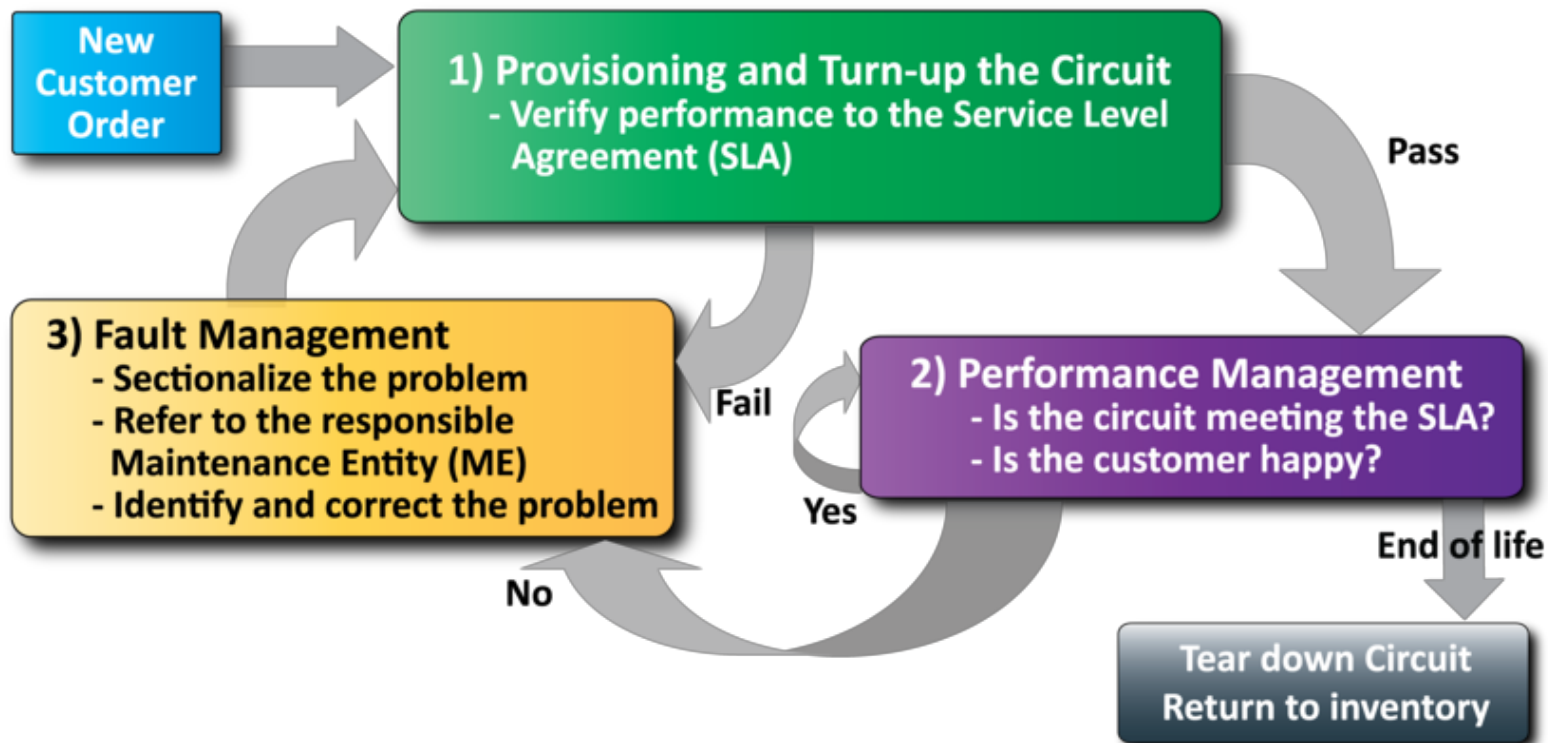
- **MEF 40 adheres to these MEF Specifications for terminology:**
  - Refer to MEF 6.1 for Ethernet service definitions
  - Refer to MEF 6.1.1 for L2CP definition
  - Refer to MEF 10.2 for EVC & UNI Service Attribute and Parameter definitions
- **MEF 40 relies on MEF 31 for protocol specific terminology**
  - Simple Network Management Protocol (SNMP)
  - SNMP Manager
  - Management Information Model (MIB)
  - Element Management System (EMS)
  - Network Management System (NMS)
  - Operations Support System (OSS)

# Relationship with other Specifications



# MEF Service Lifecycle and SOAM

## Network Management



Provisioning and Turn-up is used to bring the service “in-service”

# MEF Specification Section Review

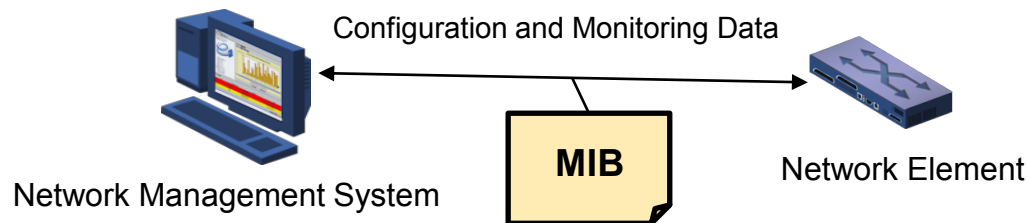


# Introducing MEF 40

- **The presentation is broken into sections:**
  - Overview
  - Network Management Concepts/Framework
  - Interfaces MIB Indexing
  - UNI-EVC MIB Structure
    - Descriptions
  - Summary
  - Where to find additional information

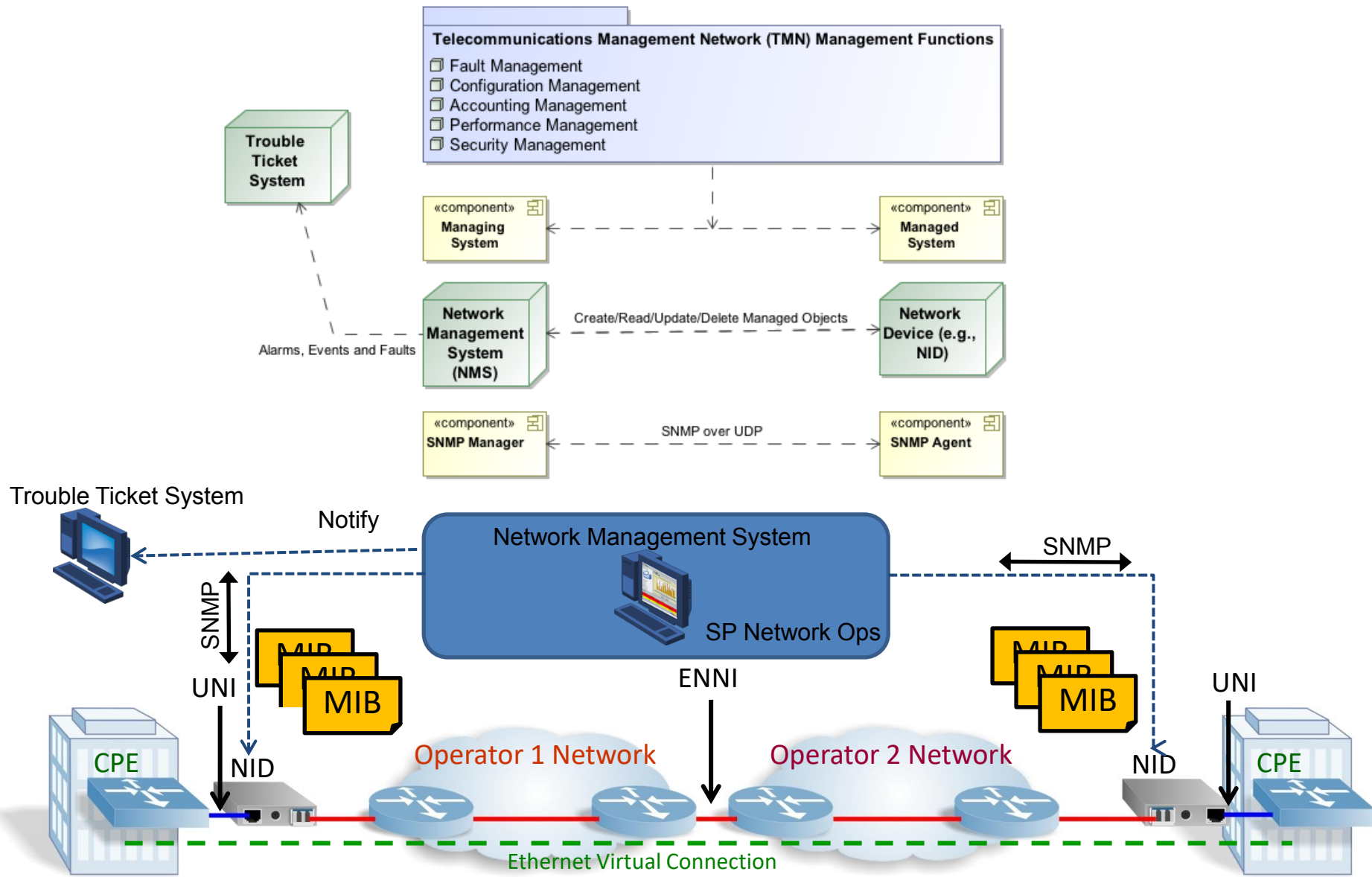
# What is a MIB?

- A Management Information Base (MIB), or data model, is a collection of managed objects that can be used to provision or query a network device from a management system, such as a centrally located NMS (Network Management System).
- A MIB along with the management protocol, such as SNMPv2c, defines a standard network management interface for administration and maintenance of network elements.





# Management Framework

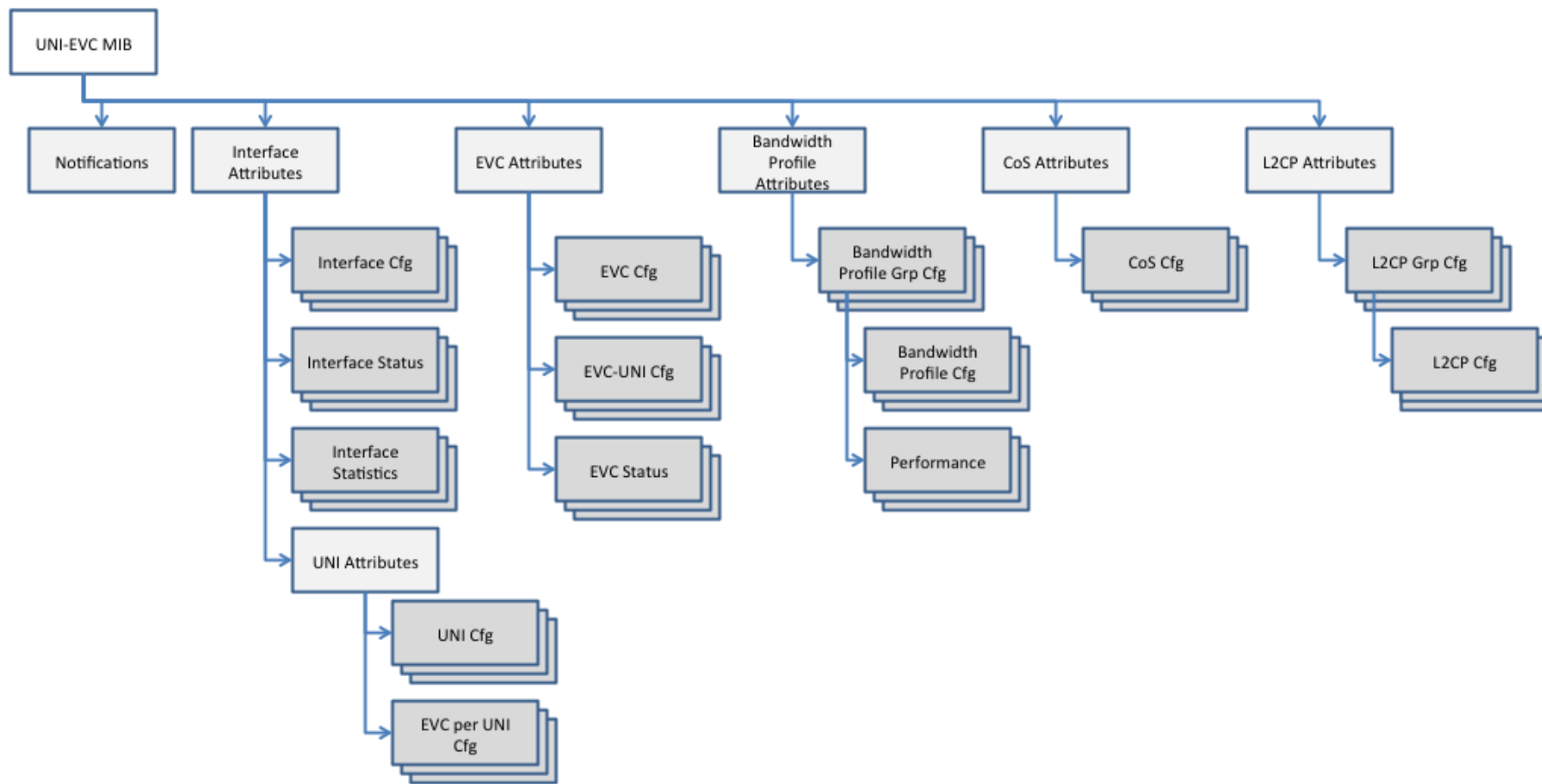


# Interfaces MIB Indexing

- MEF 40 uses RFC 2863 ifIndex with several tables
- MEF 40 supports several objects from the ifTable.
- The ifType used is ethernetCsmacd(6)

# UNI-EVC MIB Structure

- MEF-UNI-EVC-MIB defines the following groups of managed objects necessary to support configuration, status and statistics



# Service Interface Attributes

- This group of managed objects consists of
  - mefServiceInterfaceCfgTable
    - Contains basic objects (type, identifier, frame format, etc.) to provision the MEF interface on the Metro Ethernet-Network Element (ME-NE)
  - mefServiceInterfaceStatusTable
    - Contains basic status reporting objects (type, maximum number of virtual channels, maximum number of end points per virtual channel) for the MEF interface of the ME-NE
  - mefServiceInterfaceStatisticTable
    - Contains various egress/ingress frame and octet counter statistics for the MEF interface of the ME-NE

# Service UNI Attributes

- This group of managed objects consists of
  - mefServiceUniCfgTable
    - Contains objects (identifier, bundling, all-to-one bundling, multiplexing, CE VLAN ID, CE VLAN Priority) to provision the UNI attributes on the Metro Ethernet-Network Element (ME-NE)
  - mefServiceEvcPerUniCfgTable
    - Contains objects (identifier, service type, CE VLAN Map, Egress/Ingress BWP Indexes) to provision the EVC per UNI attributes on the Metro Ethernet-Network Element (ME-NE)

# Service EVC Attributes

- This group of managed objects consists of
  - mefServiceEvcCfgTable
    - Contains objects (identifier, MTU size, service type, CE VLAN id preservation, CE VLAN CoS preservation, etc.) to provision the EVC attributes on the Metro Ethernet-Network Element (ME-NE)
  - mefServiceEvcUniCfgTable
    - Contains an object to allow configuring the UNI type (root, leaf) on an EVC
  - mefServiceEvcStatusTable
    - Contains basic status reporting objects (maximum MTU size, maximum number of UNIs, operational state) for the EVC of the ME-NE



# Service Bandwidth Profile Attributes

- This group of managed objects consists of
  - mefServiceBwpCfgTable
    - Contains objects (CIR, EIR, CBS, EBS, CF, CM, etc.) to provision a Bandwidth Profile (BWP) as well as associate the BWP with a CoS ID.
  - mefServiceBwpGrpCfgTable
    - Contains objects to support BWP group settings

# Class of Service Attributes

- This group of managed objects consists of
  - mefServiceCosCfgTable
    - Contains objects (identifier, type, identifier list, L2CP destination MAC Address, L2CP Ethernet Protocol, L2CP Subtype) to provision a Class of Service Identifier profile



# Service L2CP Attributes

- This group of managed objects consists of
  - mefServiceL2cpCfgTable
    - Contains objects (type, matching scope, destination MAC address, L2CP Ethernet Protocol, L2CP Subtype) to provision an L2CP profile
  - mefServiceL2cpGrpCfgTable
    - Contains objects to support L2CP group settings

# Service Performance Attributes

- This group of managed objects consists of
  - `mefServicePerformanceTable`
    - Contains basic objects to support Traffic Performance Data Set profile settings on a Bandwidth Profile (e.g., green, yellow, red frame/octet counters)

# Service Notification Attributes

- This group of managed objects consists of
  - Contains an object to enable/disable SNMP notifications
  - Contains objects carried within the payload of SNMP notifications (date, time, configuration change type)
  - Contains the SNMP Notification which can be triggered when the configuration of an object is added, deleted or modified

# Summary

# Summary MEF 40

- MEF 40 defines the managed objects for using an SNMP management interface for configuring the UNI and EVC reference points of a CEN
  - In addition, managed objects are defined for retrieving configuration status and statistics for the UNI and EVC reference points
- MEF 40 enables MEF equipment providers to provide a standardized management interface for the UNI and EVC for
  - Configuration Management
  - Interface Network Monitoring

# Related Specifications

- **MEF 6.1 – Ethernet Services Definitions (Phase 2)**
- **MEF 6.1.1 – Layer 2 Control Protocol Handling Amendment**
- **MEF 7.2 – Carrier Ethernet Management Information Model**
- **MEF 10.2 – Ethernet Services Attributes (Phase 2)**
- **MEF 15 – Requirements for Management of Metro Ethernet Phase 1 Network Elements**
- **IETF RFC 2863 – The Interfaces Group MIB (IF-MIB)**



# Final Word

- **Configuration Management**
  - In the context of MEF 40, data models (MIBs) are defined that support UNI and EVC configuration management in CENs
- **Next Actions (For Further Information)**
  - Read the full MEF 40 technical specification and familiarize yourself with the set of defined managed objects
  - Read the full MEF 6.1 and MEF 10.2 specifications (note, review of MEF 7.2 and MEF 15 may also be helpful)
  - Understand the principal Interfaces Group (IF-MIB) managed objects, indexing and capabilities

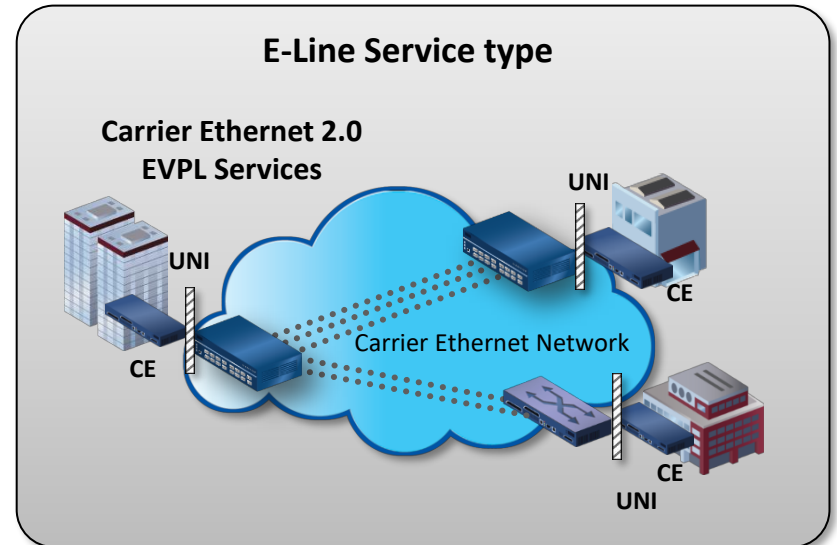
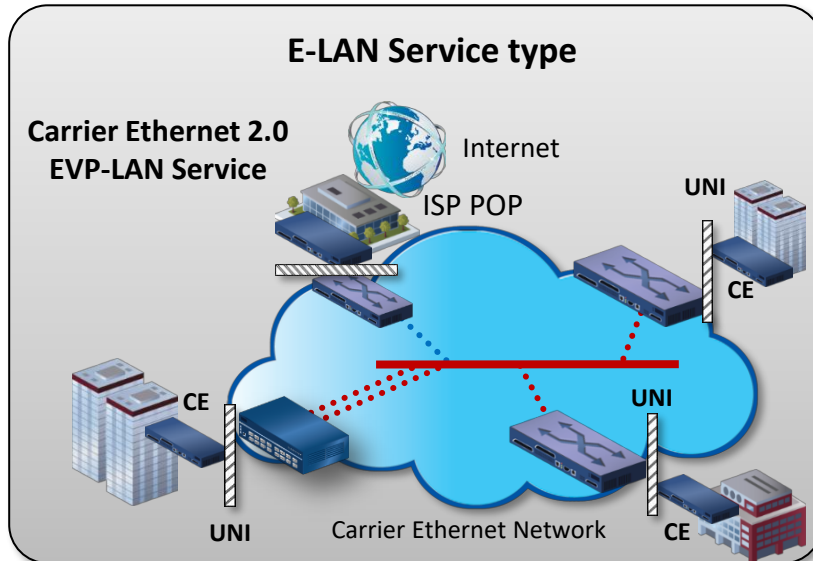
# For Full Details ...

Please visit

[www.metroethernetforum.org](http://www.metroethernetforum.org)

Select Information Center on Left

Navigation to access the full specification and extracted MIB files



**EVC:** Ethernet Virtual Connection

**UNI:** User Network Interface. the physical demarcation point between the responsibility of the Service Provider and the responsibility of the End-User/Subscriber

**CE** Customer Equipment



# MEF

*Accelerating Worldwide Adoption of  
Carrier-class Ethernet Networks and Services*

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